

Study Guide

For use with pages 351–356

GOAL Find a percent of change in a quantity.**VOCABULARY**

A **percent of change** indicates how much a quantity increases or decreases with respect to the original amount. If the new amount is greater than the original amount, the percent of change is called a **percent of increase**. If the new amount is less than the original amount, the percent of change is called a **percent of decrease**.

EXAMPLE 1 Finding a Percent of Increase

Find the percent of increase from 40 to 44.

Solution

$$\begin{aligned}
 p\% &= \frac{\text{Amount of increase}}{\text{Original amount}} && \text{Write formula for percent of increase.} \\
 &= \frac{44 - 40}{40} && \text{Substitute.} \\
 &= \frac{4}{40} && \text{Subtract.} \\
 &= 0.1 && \text{Divide.} \\
 &= 10\% && \text{Write decimal as a percent.}
 \end{aligned}$$

Answer: The percent of increase is 10%.**Exercises for Example 1**

Find the percent of increase.

- | | | |
|----------------------------------|-----------------------------------|-----------------------------------|
| 1. Original: 6
New: 10 | 2. Original: 50
New: 51 | 3. Original: 15
New: 30 |
|----------------------------------|-----------------------------------|-----------------------------------|

EXAMPLE 2 Finding a Percent of Decrease

Find the percent of decrease from 250 to 175.

Solution

$$\begin{aligned}
 p\% &= \frac{\text{Amount of decrease}}{\text{Original amount}} && \text{Write formula for percent of decrease.} \\
 &= \frac{250 - 175}{250} && \text{Substitute.} \\
 &= \frac{75}{250} && \text{Subtract.} \\
 &= \frac{3}{10} && \text{Simplify fraction.} \\
 &= 30\% && \text{Write fraction as a percent.}
 \end{aligned}$$

Answer: The percent of decrease is 30%.

LESSON

7.5

Continued

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Exercises for Example 2

Find the percent of decrease.

4. Original: 40
New: 305. Original: 55
New: 236. Original: 9000
New: 8982**EXAMPLE 3 Using a Percent of Increase**

In 1999, total attendance at United States symphony orchestras was 30,800,000. Attendance increased by about 2.9% from 1999 to 2000. What was the approximate attendance in the year 2000?

Solution

To find the attendance in the year 2000, you need to increase the attendance in 1999 by 2.9%.

$$\begin{aligned}
 \boxed{\text{2000 attendance}} &= \boxed{\text{1999 attendance}} + \boxed{\text{Amount of increase}} \\
 &= 30,800,000 + 2.9\% \cdot 30,800,000 && \text{Substitute.} \\
 &= 30,800,000 + 0.029 \cdot 30,800,000 && \text{Write percent as a decimal.} \\
 &= 31,693,200 && \text{Evaluate.}
 \end{aligned}$$

Answer: The attendance at symphony orchestras in 2000 was about 31,693,200.

EXAMPLE 4 Finding a New Amount

Your 5K time for the first race of the cross country season was 25 minutes. Your time for the last race of the season decreased by 12% from the first race time. What was your last race time of the season?

Solution

$$\begin{aligned}
 \text{Last race time} &= \text{First race time} \cdot (100\% - p\%) \\
 &= 25 \cdot (100\% - 12\%) && \text{Substitute.} \\
 &= 25 \cdot 88\% && \text{Subtract.} \\
 &= 25 \cdot 0.88 && \text{Write percent as a decimal.} \\
 &= 22 && \text{Multiply.}
 \end{aligned}$$

Answer: It took you 22 minutes to run the last 5K race of the season.

Exercises for Examples 3 and 4

Find the new amount.

7. Increase 60 by 85%.

8. Decrease 80 by 0.5%.